

Arbovirus Surveillance Summary, 2006
Massachusetts Department of Public Health (MDPH)
Arbovirus Surveillance Program

WEST NILE VIRUS (WNV)

Birds

In 2006, 4,261 dead birds were reported to the MDPH Arbovirus Surveillance Program. Of the 313 that were tested for WNV, 16 crows, 40 blue jays and 1 robin were positive for WNV (see table below). Birds that tested positive for WNV were found in 35 towns in 9 counties.

Number of Birds Reported Dead, Tested and Positive for WNV by Species, 2006

Status	Species				Total
	Crow	Blue jay	Robin	Other	
Reported	317	441	434	3069	4261
Tested	57	114	110	32	313
WNV (+)	16	40	1	0	57

Mosquito Samples

Forty-three of 9,344 mosquito samples collected and tested were positive for WNV during the 2006 transmission season. Positive samples were identified in 28 towns in 8 counties. Positive mosquito samples included two of *Culex pipiens*, 24 of *Culex pipiens/restuans* complex, 4 of *Culex* species, and 13 of *Culiseta melanura*. Mosquitoes in the *Culex* genus feed mainly on birds and occasionally on mammals, including humans. *Culex pipiens* are known to bite humans typically from dusk into the evening. Most *Culex* species have been implicated as vectors of WNV. *Culex salinarius* bite both birds and mammals, including humans, and may be involved in the transmission of both WNV and EEE virus. Finally, *Culiseta melanura* species feed almost exclusively on birds. This mosquito is the primary enzootic vector of EEE virus.

Horses

There were no cases of WNV infection identified in horses in Massachusetts in 2006.

Humans

Three WNV human cases were identified in residents of 3 towns in Middlesex and Worcester counties (see table below). Ages ranged from 55 to 83 years old. Onsets ranged from 8/25/2006 to 9/5/2006. Two of the cases presented with meningoencephalitis and were hospitalized. One case presented with West Nile fever and was not hospitalized. There were no human fatalities resulting from West Nile virus infection identified in 2006 in Massachusetts.

Specimens Tested and WNV Positive by Year, 2002-2006*

Species	2002		2003		2004		2005		2006	
	Tested	Positive	Tested	Positive	Tested	Positive	Tested	Positive	Tested	Positive
Birds	857	575	599	429	86	8	303	83	313	57
Mosquito Pools	6471	68	5980	48	7200	15	8136	99	9344	43
Horses	40	2	38	8	19	0	12	0	16	0
Humans	614	24**	790	19***	440	0	544	6	649	3

*Comparisons between years must consider variations in surveillance criteria.

**Two cases were in out of state residents; however, their exposure was believed to have been in Massachusetts.

***Includes 1 case believed to have been contracted out of state and 1 probable case.

EASTERN EQUINE ENCEPHALITIS (EEE) VIRUS

Birds

Birds are not routinely tested for EEE virus in Massachusetts because the results do not provide useful information on the level of human risk.

Mosquito Samples

One-hundred fifty-seven of 9,344 mosquito samples tested were positive for EEE virus in Massachusetts in 2006. They were collected from 44 towns in 6 counties. Positive EEE virus mosquito samples included 3 of *Aedes vexans*, 7 of *Coquillettidia perturbans*, 4 of *Culex pipiens/restuans* complex, 1 of *Culex salinarius*, 1 of *Culex* species, 136 of *Culiseta melanura*, 1 of *Culiseta minnesotae*, 2 of *Culiseta morsitans* and 2 of *Ochlerotatus canadensis*.

Horses

Six horses tested positive for EEE virus infection in Massachusetts in 2006. They were identified in 5 towns in 2 counties. In addition, one llama from the town of Scituate in Plymouth County and one harbor seal from the City of New Bedford in Bristol County tested positive for EEE virus infection.

Humans

Five human EEE cases were identified in residents of 5 communities in Bristol, Middlesex and Plymouth counties. Ages ranged from 9 to 73 years old. Onsets ranged from 8/6/2006 to 9/11/2006. Three of the cases presented with meningoencephalitis and 2 with encephalitis and all were hospitalized. In Massachusetts a total of two human fatalities resulted from EEE virus in 2006.

Summary of Aerial Applications

In response to the MDPH findings that significant risk of human disease existed due to high levels of eastern equine encephalitis (EEE) virus activity in areas of southeastern Massachusetts, the Governor declared a Public Health Emergency. Aerial spraying was deployed for the first time in 16 years to reduce the threat.

There were two rounds of aerial application of Anvil, a synthetic pyrethroid-containing product. The first occurred on August 8, 2006 and involved approximately 159,000 acres of land in Plymouth and Bristol counties. Towns that were wholly included were: Middleborough, Carver, Kingston, Plympton and Lakeville; partial areas of the following towns were also sprayed: New Bedford, Acushnet, Duxbury, Halifax, Bridgewater, Raynham, Freetown, Taunton, Rochester, and Plymouth.

While aerial spraying did reduce the number of mosquitoes in the region, there were continued positive EEEV collections of both bird-biting and human-biting mosquitoes. As the risk to humans continued to remain at a critical level, additional aerial spraying of a larger region in southeastern Massachusetts was implemented. During the week of August 20-26 another aerial application occurred. The second aerial application covered 425,000 acres.